

THURSDAY, MARCH 22, 1877

BRITISH MANUFACTURING INDUSTRIES

British Manufacturing Industries. Edited by G. Phillips Bevan, F.G.S. "Hosiery and Lace," by the late W. Felkin, Nottingham; "Carpets," by Christopher Dresser, Ph. D.; "Dyeing and Bleaching," by T. Sims (second edition); "Pottery," by L. Arnoux, of Minton's Factory; "Glass and Silicates," by Prof. Barff, M.A.; "Furniture and Woodwork," by J. H. Pollen, M.A. (second edition). (London: Stanford, 1877.)

Industrial Classes and Industrial Statistics. By G. Phillips Bevan, F.G.S. Vol. 1., "Mining, Metals, Chemicals, Ceramics, Glass, and Paper." Vol. 2., "Textiles and Clothing, Food, Sundry Industries." (London: Stanford, 1876-7.)

THE first edition of the first two volumes has been already noticed in these columns. The speedy issue of a second edition bears out the favourable opinion previously expressed with regard to them, and of this series of short comprehensive essays on British manufactures generally. There can be no doubt that any one wishing to take a general view of any of the subjects on which they treat will gain a good idea of their principles from a perusal of these volumes.

The latter two volumes, dealing as they do with the condition of the British industrial classes considered as *workers*, form an appropriate pendant to the "British Manufacturing Industries," in which the nature of the *work* which they perform has been already spoken of. Though, as Mr. Bevan says, the British workman "has from a political point of view . . . been frequently written and talked about—too much so, indeed, for his own good or for the good of the country—his social condition as dependent upon, or connected with, his special branch of labour," is comparatively seldom inquired into. This topic forms the subject of the present work.

In treating the subject one or more chapters are devoted to each of the divisions named above. A description of the character of the work in each department is given, together with the conditions whether healthy or otherwise, under which it is performed. This is supplemented by statistics as to the numbers employed in the various industries, the quantity of material manufactured, its value, the wages of the workman or workwoman, the effects of various industries on the rate of mortality, and some account of working-class legislation and federation. The distribution of the various industries over the country is graphically shown by two maps in each volume.

The statistics are very full and complete, and being compiled mostly from official sources, may be taken as accurate and reliable. With regard to the introduction of this profusion of figures the author remarks that he has done so "in the hope of showing, how intimately allied is the development of our manufactures with the state of wages and the general condition of the working classes." There can be no doubt that Mr. Bevan's volumes clearly show that our English operatives are in better condition generally now than at any previous period, and this is so whatever be the standpoint from which they are regarded.

In reading the descriptions of the various handicrafts and under what conditions they are executed, one sees that there is much yet to be done in some branches to render the work still easier of execution and less unhealthy. Science has done much for the coal-miner; but more remains to be done in order that he may be better protected from sudden outbursts of fire-damp or choke-damp. It is evident from the quotation of Dr. Angus Smith's analyses of the air from metal mines, that some further legislative enactment is required to compel the more thorough ventilation of such mines. Blast-furnace workmen, it is true, do not work under very unhealthy or dangerous conditions; but there are one or two points in which there is room for improvement. For example, the "chargers" more particularly, are now and again rendered insensible by breathing escaping carbonic oxide, sometimes with fatal results; while once in a while, from the fall of the material in the furnace after "scaffolding," explosions occur in the "hearth" resulting in the forcible expulsion of the front or side of the furnace and of the molten metal, which occasionally envelops the workmen, who in some instances have been literally roasted to death. Possibly at some future period the dangers to health and life arising from these causes may be diminished or entirely obviated by the application of scientific principles.

The injurious effects and diseases resulting from the vapour of ordinary phosphorus and "phosphoric fumes" in match-making are fully pointed out (and the remedy in the use of red phosphorus), also those of oxide of zinc, sparks of metal and dust, poisonous gases, powdered glass and emery, and poisonous colours, in brass, needle, chemical, glass and emery paper, and paper-hanging manufactures. In the second volume the "sizing" of cotton goods, "singeing" of fabrics generally, "heckling" of flax, preparation of tobacco, use of "Scheele's green" and similar preparations in flower-making, and the closeness and general want of ventilation in workrooms, in dress-making, &c., are shown to result prejudicially to the health of the worker. Affections of the eyes from close work, as in watch and lace making, are not lost sight of. Neither are deformities resulting from working in constrained and unnatural positions.

In this connection it may perhaps reasonably be doubted—as the result of actual experience—whether "the effects of chlorine are transient and less serious" than follow from the inhalation of sulphuretted hydrogen. Weldon's chlorine-process is noted as an improvement on the old process, while Deacon's—which may fairly rank with it—is left unnoticed. On the same page a small matter needs correction; "manganite" and "permanganite" should, of course, be manganate and permanganate. Mr. Bevan might be puzzled, perhaps, to show how tobacco acts as food, under which head he classes it.

A list is given of the legislative Acts hitherto passed affecting industries, which shows that the amelioration of the condition of the worker to its present improved state has not been an easy task. The trade societies are classed as trades unions, friendly societies, and co-operative societies; of the first the opinion is given that they are "at most a doubtful blessing," while the latter are considered as both useful and excellent.

The abundant statistics given cannot fail to be of great

service in many ways. The volumes altogether are very readable, and throughout the statements are usually reliable. Should a second edition be required it might possibly be improved by the addition of a "table of contents."

W. H. W.

THE GERM THEORY

The Germ Theory Applied to the Explanation of the Phenomena of Disease. "The Specific Fevers." By T. MacLagan, M.D. (London: Macmillan and Co., 1876.)

IN his preface the author states that "one object which he has in view is to rescue the germ theory of disease from a false and misleading position, and to give to it its true and legitimate standing as a pathological question." The subject discussed is whether the propagation of germs in the system can produce specific fevers. He believes it can, and assumes that all contagia are living organisms, probably albuminous, reproducing their kind, living for a considerable period, speedily perishing when freely exposed to the atmosphere, and so minute as to elude the highest powers of the microscope.

If, however, the particles in sheep-pox, small-pox, and vaccine, be the infecting matter, they are easily seen by the microscope, and ought therefore to be found in the blood, but such is not the case.

Dr. MacLagan holds that "all microzymes are not contagia, but all contagia may be microzymes." The fact that the contagia fluids are most potent when fresh, and that their virulence diminishes as bacteria increase in them is explained by saying that disease-germs are more minute organisms than bacteria, and are the food on which bacteria live. According to this view, bacteria not only do not constitute infection, but destroy it.

Dr. MacLagan says "that the chief action of an organism on its environment is the consumption of nitrogen and water. A disease-germ is a parasite, and requires a special *nidus* as well as nitrogen and water; the parasite finds a *something* in its *nidus*—the second factor—the parasite being the first. Without this second factor no bad result follows the reception of the contagium." Different periods of incubation are accounted for by the varying amount of the second factor and the number of germs imbibed; incubation itself by germ-growth and reproduction; and the onset of the symptoms by the germs becoming mature.

The consumption of nitrogen by the contagium particles causes wasting of the tissues, *i.e.*, the organisms eat the albumen intended to nourish the body. They also drink largely of water from the liquor sanguinis, which, being rich in soda, explains why soda-salts are often absent from the excretions during fever. The same retention of soda-salts, however, often happens in acute pneumonia, which has no relation to infectious disease.

Increased elimination of urea is explained thus:—"The increased consumption of liquor sanguinis by the contagium particles leads to increased formation of retrogressive albumen and of urea." It seems by this that contagium particles have livers and kidneys, and excrete urea. Diminished excretion of urea is held as "due to consumption by the contagium particles of the water requisite to enable the kidneys to perform their excretory

function." What then, we ask, becomes of the water consumed by the contagium particles? Do their kidneys excrete urea in excess with limited water, while those of the patient are unable to do so? or do the contagium particles not consume water when the urea is increased as well as when it is diminished? In fever the quantity of water drunk by the patients is very great, but that, according to Dr. MacLagan, is because the quantity of contagium particles is also very great. We find, however, the same symptoms in symptomatic fevers, with no contagium particles present, and we have great difficulty in believing that ultra-microscopic organisms in a person's blood could consume several tumblerfuls of water in twenty-four hours.

The heat of specific fevers is partly ascribed to the propagation of the contagium causing increased consumption of tissue. But increase of living matter causes the disappearance of heat, not its production. Again, the author states that the fecundation of the organisms may be accompanied by an elevation of temperature analogous to that which occurs under similar circumstances in other organisms.

As regards treatment, at page 163 the following occurs: "If we were to bleed, to purge, to give antimony to, or even *simply to withhold food and water* from, all the cases of typhus and enteric fever which occur, there can be no doubt that we should find the mortality from those diseases greatly increased." Dr. MacLagan is right here, for by *simply withholding food and water*, there can be no doubt that he would greatly increase the mortality by starving his patients to death. He, however, believes that fever patients should be supplied with nitrogen and water to compensate for what the organisms consume.

The cessation of the fever and its specificity are attributed—the first, to the organisms, as parasites, requiring a special *nidus* which contains a suitable pabulum, and when the latter is exhausted the fever ceases; the second, to a local lesion in the *nidus*, which is the part where fecundation of the organism takes place. In small pox this *nidus* and lesion is in the skin, in typhoid in the bowels, and so on. It is well-known, however, that many medicines act on special parts of the body, and yet we do not think of calling them parasites which require a special *nidus*. The author gives many other plausible, and some very unusual explanations of febrile phenomena by means of the germ theory, all of which, we believe, are far more clearly and rationally explicable on the physico-chemical theory. The writing of this book must have cost Dr. MacLagan much trouble. We have read it very carefully, and commend the author's honesty in stating his views, but question if the work will go far in realising the object for which it was ostensibly written.

OUR BOOK SHELF

A Manual of Cinchona Cultivation in India. By George King, M.B., F.L.S., Superintendent of the Royal Botanical Garden, Calcutta, and of Cinchona Cultivation in Bengal. (Calcutta, 1876.)

THIS manual is another contribution to the numerous books, papers, and articles that have appeared of late years on the subject of cinchona. Varied as these contributions have been, and valuable each one in itself, this manual brings together much that is useful, not only on